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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/653,921	09/04/2003	Gary R. Pickrell	01640334AA	3781

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EXAMINER	
CHIEM, DINH D	

ART UNIT	PAPER NUMBER
2883	

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/653,921	PICKRELL ET AL.
	Examiner	Art Unit
	Erin D. Chiem	2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 September 2003*.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *9/4/03* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ___.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the communication to Supervisory Primary Examiner, Frank G. Font, regarding the typographical errors on the claim numbers. This action will now replace the first non-final rejection sent on March 11, 2005, and the statutory time period for reply will be reset. However, documents such as the Form USPTO-1449 and form USPTO-892 will not be included to ease the paper-processing burden.

Information Disclosure Statement

The prior art document submitted by Applicant in the Information Disclosure Statements filed on September 4, 2003, have been considered, and made of record. See form PTO-1449.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1, 2, 4-8, and 10-14 rejected under 35 U.S.C. 102(b) as being anticipated by Brogardh et al. (US 4,569,570). Brogradh et al. teach an optical sensor comprising a body of monocrystalline material, referring to Fig. 2, a fiber optic element having an end surface, and bonded to the body of the crystalline material (Abstract) and a reflective surface positioned by the body of crystalline material at a location separated from the end surface of the fiber optic element to form a gap. Etching technology was employed to create the body of crystalline

element to form a gap. Etching technology was employed to create the body of crystalline material in the form of a tube and provided the V-groove on the substantially planar surface, Fig. 3, where the fiber optic element is securely held in place. Regarding claims 2 and 10, the limitation of matching coefficient of thermal expansion (CTE) of the crystalline material and the fiber optic element is well-known in the art for advantages just as keeping alignment of the optical elements, resulting in a low loss medium, and the matched CTE is advantageous for not causing thermal stress amongst the optical elements. Refer to US Patent 4,722,586 as an exemplary reference.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 3 and 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brogardh et al. in view of Nelson (US4, 756,627).

5. Brogardh et al. teach an optical sensor comprising a body of monocrystalline material, referring to Fig. 2, a fiber optic element having an end surface, and bonded to the body of the crystalline material (Abstract) and a reflective surface positioned by the body of crystalline material at a location separated from the end surface of the fiber optic element to form a gap. Etching technology was employed to create the body of crystalline material in the form of a tube and provided the V-groove on the substantially planar surface, Fig. 3, where the fiber optic

element is securely held in place. But Brogardh et al. do not teach maximizing the difference of the CTE between the fiber optic element and the substrate.

6. Nelson teach the concept of detecting temperature by having a different CTE between the two adjacent elements (i.e., fiber optic element and the substrate) such that the thermal stress induced by the cause the change in refractive index causing a transfer of light energy incident and the direct change of refractive index due temperature change can be measured. Such method of sensing temperature change "--improve the sensitivity by a factor of 10,000—" (col. 4, line 22 – 51).

7. Since Brogardh et al. and Nelson are both from the same field of endeavor; the purpose disclosed by Nelson would have been recognized in the pertinent art of Brogardh et al.

8. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ photoelastic waveguides in which metal or dielectric material is deposited, at high temperature, on alternating substrate with crystalline material, on cooling, the differing of CTE result in stresses occurring in the substrate crystal, such that the waveguides, now, have zones of increased or decreased refractive index. The application of maximizing CTE between the optical elements such as those used in sensors can improve sensitivity to temperature change by a factor of 10, 000.

9. Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brogardh et al. in view of Zuckerwar et al. (US 5,146,083).

10. Brogardh et al. teach an optical sensor comprising a body of monocrystalline material, referring to Fig. 2, a fiber optic element having an end surface, and bonded to the body of the crystalline material (Abstract) and a reflective surface positioned by the body of crystalline

material at a location separated from the end surface of the fiber optic element to form a gap. Etching technology was employed to create the body of crystalline material in the form of a tube and provided the V-groove on the substantially planar surface, Fig. 3, where the fiber optic element is securely held in place. Furthermore, Brogardh et al. disclose a diaphragm (Fig. 2, 24), but Brogardh et al. do not teach the sensor further includes a diaphragm having a reflective surface.

11. Zuckerwar et al. disclose as prior art that in Iwamoto et al.'s patent (US 4,687,927) teach a sensor in which light is transmitted through an optical fiber to an unstretched diaphragm having a reflective surface for measuring pressure differential, caused by the surrounding fluid medium, by detecting the light intensity reflected back from the reflective diaphragm.

12. Since Brogardh et al. and Zuckerwar et al. are both from the same field of endeavor; the purpose disclosed by Zuckerwar et al. would have been recognized in the pertinent art of Brogardh et al.

13. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to apply a thin film of reflective material to the diaphragm as a mean to detect the pressure differential of the fluid in the surrounding medium to a sensor that would be applicable to detect temperature or pressure in viscous fluid. The reflective film on the diaphragm reflects light to a detector when pressure is applied to the diaphragm. By measure the intensity of light reflecting back, one having ordinary skill in the art would be able to determine the pressure being applied.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sun et al. and Elster et al. teach similar optical sensors which are employed to detect temperature, pressure, and other physical parameters in harsh environment.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin D. Chiem whose telephone number is (571) 272-3102. The examiner can normally be reached on Monday - Thursday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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